

Process Costing

Illustrating Process Costing

Case 1: Case 1: Process Costing with No Beginning or Ending Work-in-Process Inventory

Data for the assembly department for January 2012 are as follows:

Physical Units for January 2012

Work in process, beginning inventory (January 1)	0 units
Started during January	400 units
Completed and transferred out during January	400 units
Work in process, ending inventory (January 31)	0 units

Total Costs for January 2012

Direct material costs added during January	\$32,000
Conversion costs added during January	<u>\$24,000</u>
Total assembly department costs added during January	\$56,000

Direct material cost per unit	(\$32,000, 400 units)	\$ 80
Conversion cost per unit	(\$24,000, 400 units)	\$60
Assembly department cost per unit		\$140

Case 2: Process Costing with Zero Beginning and Some Ending Work-in-Process Inventory

	A	B	C	D	E
		Physical Units (SG-40s) (1)	Direct Materials (2)	Conversion Costs (3)	Total Costs (4) = (2) + (3)
1					
2	Work in process, beginning inventory (February 1)	0			
3	Started during February	400			
4	Completed and transferred out during February	175			
5	Work in process, ending inventory (February 29)	225			
6	Degree of completion of ending work in process		100%	60%	
7	Total costs added during February		\$32,000	\$18,600	\$50,600

The five steps of process costing are as follows:

Step 1: Summarize the flow of physical units of output.

Step 2: Compute output in terms of equivalent units.

Step 3: Summarize total costs to account for.

Step 4: Compute cost per equivalent unit.

Step 5: Assign total costs to units completed and to units in ending work in process.

Physical Units and Equivalent Units (Steps 1 and 2)

	A	B	C	D
1		(Step 1)	(Step 2)	
2			Equivalent Units	
3	Flow of Production	Physical Units	Direct Materials	Conversion Costs
4	Work in process, beginning	0		
5	Started during current period	400		
6	To account for	400		
7	Completed and transferred out during current period	175	175	175
8	Work in process, ending ^a	225		
9	(225 × 100%; 225 × 60%)		225	135
10	Accounted for	400		
11	Equivalent units of work done in current period		400	310
12				
13	^a Degree of completion in this department; direct materials, 100%; conversion costs, 60%.			

Calculation of Product Costs (Steps 3, 4, and 5)

						
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	A	B	C	D	E	
1			Total Production Costs	Direct Materials	Conversion Costs	
2	(Step 3)	Costs added during February	\$50,600	\$32,000	\$18,600	
3		Total costs to account for	<u>\$50,600</u>	<u>\$32,000</u>	<u>\$18,600</u>	
4						
5	(Step 4)	Costs added in current period	\$50,600	\$32,000	\$18,600	
6		Divide by equivalent units of work done in current period (Exhibit 17-1)		÷ 400	÷ 310	
7		Cost per equivalent unit		\$ 80	\$ 60	
8						
9	(Step 5)	Assignment of costs:				
10		Completed and transferred out (175 units)	\$24,500	(175 ^a × \$80)	+ (175 ^a × \$60)	
11		Work in process, ending (225 units):	<u>26,100</u>	(225 ^b × \$80)	+ (135 ^b × \$60)	
12		Total costs accounted for	<u>\$50,600</u>	<u>\$32,000</u>	+ <u>\$18,600</u>	
13						
14	^a Equivalent units completed and transferred out from Exhibit 17-1, step 2.					
15	^b Equivalent units in ending work in process from Exhibit 17-1, step 2.					

Case 3: Process Costing with Some Beginning and Some Ending Work-in-Process Inventory

	A	B	C	D	E
		Physical Units (SG-40s) (1)	Direct Materials (2)	Conversion Costs (3)	Total Costs (4) = (2) + (3)
1					
2	Work in process, beginning inventory (March 1)	225	\$18,000 ^a	\$8,100 ^a	\$26,100
3	Degree of completion of beginning work in process		100%	60%	
4	Started during March	275			
5	Completed and transferred out during March	400			
6	Work in process, ending inventory (March 31)	100			
7	Degree of completion of ending work in process		100%	50%	
8	Total costs added during March		\$19,800	\$16,380	\$36,180
9					
10					
11	^a Work in process, beginning inventory (equals work in process, ending inventory for February)				
12	Direct materials: 225 physical units × 100% completed × \$80 per unit = \$18,000				
13	Conversion costs: 225 physical units × 60% completed × \$60 per unit = \$8,100				

Weighted-Average Method

Step 1: Summarize the Flow of Physical Units of Output.

Step 2: Compute Output in Terms of Equivalent Units.



	Home	Insert	Page Layout	Formulas	Data	Review	View
	A				B	C	D
1					(Step 1)	(Step 2)	
2						Equivalent Units	
3	Flow of Production				Physical Units	Direct Materials	Conversion Costs
4	Work in process, beginning (given, p. 613)				225		
5	Started during current period (given, p. 613)				275		
6	To account for				500		
7	Completed and transferred out during current period				400	400	400
8	Work in process, ending ^a (given, p. 613)				100		
9	(100 × 100%; 100 × 50%)					100	50
10	Accounted for				500		
11	Equivalent units of work done to date					500	450
12							
13	^a Degree of completion in this department; direct materials, 100%; conversion costs, 50%.						

Step 3: Summarize Total Costs to Account For.

Step 4: Compute Cost per Equivalent Unit.

Step 5: Assign Total Costs to Units Completed and to Units in Ending Work in Process.

	Home	Insert	Page Layout	Formulas	Data	Review	View
	A	B	C	D	E		
1			Total Production Costs	Direct Materials	Conversion Costs		
2	(Step 3)	Work in process, beginning (given, p. 613)	\$26,100	\$18,000	\$ 8,100		
3		Costs added in current period (given, p. 613)	36,180	19,800	16,380		
4		Total costs to account for	\$62,280	\$37,800	\$24,480		
5							
6	(Step 4)	Costs incurred to date		\$37,800	\$24,480		
7		Divide by equivalent units of work done to date (Exhibit 17-4)		÷ 500	÷ 450		
8		Cost per equivalent unit of work done to date		\$ 75.60	\$ 54.40		
9							
10	(Step 5)	Assignment of costs:					
11		Completed and transferred out (400 units)	\$52,000	(400 ^a × \$75.60)	÷ (400 ^a × \$54.40)		
12		Work in process, ending (100 units):	10,280	(100 ^b × \$75.60)	÷ (50 ^b × \$54.40)		
13		Total costs accounted for	\$62,280	\$37,800	\$24,480		
14							
15	^a Equivalent units completed and transferred out from Exhibit 17-4, Step 2.						
16	^b Equivalent units in ending work in process from Exhibit 17-4, Step 2.						

First-In, First-Out Method (FIFO)

Step 1: Summarize the Flow of Physical Units of Output.

Step 2: Compute Output in Terms of Equivalent Units.

					Home	Insert	Page Layout	Formulas	Data	Review	View
	A					B	C	D			
1						(Step 1)	(Step 2)				
2						Equivalent Units					
3	Flow of Production					Physical Units	Direct Materials	Conversion Costs			
4	Work in process, beginning (given, p. 613)					225	(work done before current period)				
5	Started during current period (given, p. 613)					275					
6	To account for					500					
7	Completed and transferred out during current period:										
8	From beginning work in process ^a					225					
9	[225 × (100% – 100%); 225 × (100% – 60%)]						0	90			
10	Started and completed					175 ^b					
11	(175 × 100%; 175 × 100%)						175	175			
12	Work in process, ending ^c (given, p. 613)					100					
13	(100 × 100%; 100 × 50%)						100	50			
14	Accounted for					500					
15	Equivalent units of work done in current period						275	315			
16											
17	^a Degree of completion in this department; direct materials, 100%; conversion costs, 60%.										
18	^b 400 physical units completed and transferred out minus 225 physical units completed and										
19	transferred out from beginning work-in-process inventory.										
20	^c Degree of completion in this department: direct materials, 100%; conversion costs, 50%.										

Step 3: Summarize Total Costs to Account For.

Step 4: Compute Cost per Equivalent Unit.

Step 5: Assign Total Costs to Units Completed and to Units in Ending Work in Process.

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	A	B	C	D	E
1			Total Production Costs	Direct Material	Conversion Costs
2	(Step 3)	Work in process, beginning (given, p. 613)	\$26,100	\$18,000	\$ 8,100
3		Costs added in current period (given, p. 613)	36,180	19,800	16,380
4		Total costs to account for	<u>\$62,280</u>	<u>\$37,800</u>	<u>\$24,480</u>
5					
6	(Step 4)	Costs added in current period		\$19,800	\$16,380
7		Divide by equivalent units of work done in current period (Exhibit 17-6)		÷ 275	÷ 315
8		Cost per equivalent unit of work done in current period		<u>\$ 72</u>	<u>\$ 52</u>
9					
10	(Step 5)	Assignment of costs:			
11		Completed and transferred out (400 units):			
12		Work in process, beginning (225 units)	\$26,100	\$18,000	\$ 8,100
13		Costs added to beginning work in process in current period	4,680	(0 ^a × \$72) + (90 ^a × \$52)	
14		Total from beginning inventory	30,780		
15		Started and completed (175 units)	21,700	(175 ^b × \$72) + (175 ^b × \$52)	
16		Total costs of units completed and transferred out	52,480		
17		Work in process, ending (100 units):	9,800	(100 ^c × \$72) + (50 ^c × \$52)	
18		Total costs accounted for	<u>\$62,280</u>	<u>\$37,800</u>	<u>\$24,480</u>
19					
20		^a Equivalent units used to complete beginning work in process from Exhibit 17-6, Step 2.			
21		^b Equivalent units started and completed from Exhibit 17-6, Step 2.			
22		^c Equivalent units in ending work in process from Exhibit 17-6, Step 2.			